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ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

Cliffrose and Mountainmahogany Seeds Retain Viability  
6 Years in Cold Storage

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Viability was highest for seeds stored at -5° to -10°F. or 36° to 44°F.

Keywords: Seed viability, *Cowania mexicana*, *Cercocarpus montanus*.



CLIFFROSE

Published information is meager concerning storage requirements for seeds of cliffrose (*Cowania mexicana* D. Don) and true mountainmahogany (*Cercocarpus montanus* Raf.). According to the USDA Forest Service (1948), cliffrose seeds can be stored at ordinary temperatures for at least 7 years, and one lot of mountainmahogany seeds still retained high viability after dry storage for 5 years in burlap bags in a warehouse.

To obtain further information about storage conditions for seeds of these two species, seeds were put in 1-quart metal cans with quarter-turn lids (not airtight) and stored 6 years under four conditions: in a freezer, in a refrigerator, in a heated garage, and outdoors. Facts pertaining to the seeds are:

	Cliffrose	Mountainmahogany
National Forest where collected	Kaibab	Santa Fe
Date collected	June 1963	Oct. 1963
Number of seeds per pound	58,300	32,800
Date put in storage	Aug. 30, 1964	Sept. 2, 1964
Percent moisture content when put in storage	8.3	7.8
Maximum percent germination after 1 year in storage (1965)	95	89

<sup>1</sup>Range Scientist, Rocky Mountain Forest and Range Experiment Station, located at Albuquerque, in cooperation with the University of New Mexico; Station's central headquarters maintained at Fort Collins, in cooperation with Colorado State University.



In September 1970, 250-seed samples were taken to represent each storage condition. Seeds were stratified in moist vermiculite 30 days, then germinated for 1 month at an average temperature of 55.8°F. (range 54° to 57°F.). Seeds were considered germinated when radicles and shoots were 1 inch long.

Seeds stored at -5° to -10°F. or 36° to 44°F. for 6 years germinated significantly better than other seeds (values followed by the same letter do not differ significantly at the 0.05 level):

	Cliffrose	Mountain-mahogany
Storage conditions:		
-5° to -10°F. (freezer)	93.5a	84.4a
36° to 44°F. (refrigerator)	94.5a	81.6a
55° to 95°F. (heated garage)	82.0b	61.6b
-15° to 105°F. (outdoors in 30-gallon metal container)	64.5c	42.4c

Differences in retention of viability can probably be attributed to temperature differences; however, minor variations in seed moisture content may also have been important.

Retention of viability is affected by fluctuations in moisture content of the seed, especially fluctuations around the so-called "critical" moisture content, which varies with kind of seed (Barton 1961). Fluctuations in seed moisture content, although not measured, were no doubt greatest for seeds stored outdoors for 6 years. After summer rains, the combination of high humidity and high temperature could have had detrimental effects on these seeds. Since seeds lose viability rapidly under high humidity and high temperature (Mayer and Poljakoff-Mayber 1963), conditions within the freezer or refrigerator were undoubtedly more satisfactory for seed storage than those in the garage and outdoors.



TRUE MOUNTAINMAHOGANY

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